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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,413	02/25/2004	Shigeru Yao	054160-5012-02	9813

9629 7590 02/23/2007

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EXAMINER	
VO, HAI	

ART UNIT	PAPER NUMBER
1771	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/785,413	YAO ET AL.	
	Examiner	Art Unit	
	Hai Vo	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The 112, second paragraph, the art rejections and the double patenting rejections are withdrawn.
2. New ground of rejection is made in view of Saunders et al, the article "Microporous Polyimide Films for Reduced Dielectric Applications", SAND94-2831, August 1996, 13 pages.
3. The declaration from Yoshihiro Kusuki was filed on 09/30/2003 during the prosecution of the Patent Application No. 09/539,929 to overcome the art rejections over Tomioka et al (US 5,510,395). The copy of the declaration was resubmitted on 12/4/2006 and has been placed in the application file.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 15-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The pore size at the film surfaces ranging from 0.14 to 2.8 microns is new disclosure of the invention. The pore size range was neither recognized nor expected from the originally filed application and significantly changes the scope of the invention.

However, it is noted that the pore size at the film surfaces ranging from 0.4 to 0.9 microns is fully supported by the description in examples 3 and 4.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 15-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders et al, the article "Microporous Polyimide Films for Reduced Dielectric Applications", SAND94-2831, August 1996, 13 pages in view of Jasne et al (US 5,153,303). Saunders teaches a polyimide film useful as a dielectric layer for semiconductor devices (abstract). Saunders teaches the porous film having a porosity of 68%, thickness of 22 microns, pore size of 1.4 microns, and a dielectric constant of 1.88 (column 4, 50-51). In accordance to the claims, the pore size in the center of the film overlaps with that at the film surfaces. Since the claims do not clearly set forth the pore sizes in the center of the film and at the film surfaces to be different, an average pore size of 1.4 microns would read on Applicants' pore size in the center of the film and pore size at the film surfaces as well. Saunders teaches that the porous film does not have a dense layer on either of the surfaces (the first five lines of the second paragraph at page 7). Saunders does not specifically disclose a polyimide formed from a biphenyltetracarboxylic acid and para-phenylene diamine. Jasne, however,

teaches the polyimide film suitable as a dielectric layer for semiconductor devices can be made from a biphenyltetracarboxylic acid and para-phenylene diamine (column13, lines 53-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the polyimide film from a biphenyltetracarboxylic acid and para-phenylene diamine because it is well known in the polymer art to make thermally stable all aromatic polyimides by the condensation polymerization of dianhydrides and diamines.

Saunders as modified by Jasne does not specifically disclose the heat shrinkage, gas permeability and continuous pore structure. However, it appears that Saunders as modified by Jasne used the same casting technique as Applicants to form the porous film that has a thickness, void volume, dielectric constant and pore size within the claimed ranges. The resulting porous film is found useful as a dielectric layer for semiconductor devices as the porous film of the present invention. Additionally, the continuous pore structure is dictated by the pore size, void volume and dielectric constant. The modified porous film apparently achieves all of these physical characteristics. Hence, it is not seen that the porous film could have the heat shrinkage, gas permeability and continuous pore structure different from that of the present invention so as to achieve all listed physical characteristics and to be suitable as the dielectric layer for semiconductor devices. Accordingly, the heat shrinkage, gas permeability and continuous pore structure would be inherently present.

Response to Arguments

8. The art rejections over JP 2-2856 taken alone or in combination with Dorval have been withdrawn in view of Applicants' arguments. According to JP 2-2856 and in a complete contrast from the claimed invention, the porous polyimide film has a dense layer on a surface of the film.

9. The art rejections based on O'Neill have been withdrawn in light of Applicants' arguments. O'Neill teaches a nanoporous film having isotropic pore structure. The nanoporous film has an average pore size of 30 nm or less, which would exclude the pore size at the film surface in the range from 140 to 2800 microns as set out in the claims.

10. The declaration from Shyusei Ohya filed 12/04/2006 is fully reviewed and considered. The experimental data as shown in the declaration have demonstrated that the porous polyimide film has an average pore size at the film surfaces ranging from 0.14 to 2.8 microns. However, since that pore size range was neither recognized nor expected from the originally filed application and significantly changes the scope of the invention, the pore size raises an issue of new matter.

11. The provisional double patenting rejections over the copending Application No. 10/784,982 are considered moot in view of the abandonment of the Application.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hai Vo

HV

HAI VO
PRIMARY EXAMINER